



NIH History Highlights **Fall 2004**

**The National Institutes of Health
Department of Health & Human Services**

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(l. to r.) Victoria Harden, Raynard Kington, and Thomas Söderqvist, NIH History Day 2004 (see p. 6)

"Past in the Present," a new exhibit, opens in Building 1 (see p. 9)



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Dean Dental Instrument Collection by Michele Lyons

In the movies, a dentist wielding an array of metal instruments often inspires terror. The hero's eyes widen as the villain unleashes a dentist-torturer to obtain valuable information. Your own muscles tense at the familiar sound of a dental pick scraping against teeth during a cleaning. Later, even looking at an array of dental instruments might put you into a panic. But at a museum, a collection of early 20th-century dental instruments can tell many new stories. As curator of the NIH Stetten Museum, I have begun to learn more about dental instruments than I ever thought possible...and I have come to realize that they can tell us about much more than fear.

The NIH Stetten Museum has received a donation of dental instruments from the family of Dr. H. Trendley Dean (1893-1962). Dean came to the NIH in 1931, assigned by the Public Health Service to perform dental investigations. "The Father of Fluoridation" is best known for his investigations into the relationship between fluoride and dental caries (cavities). His research resulted in the fluoridation of municipal water systems all over the United States. He also became the first director of the National Institute of Dental Research (1948-1953). The donated collection consists of 104 scalers, hatchets, and chisels; 13 extracting forceps and exolevers (used to remove roots); various dental dams and matrix retainers; 17 impression trays; equipment to make crowns and dentures, including false teeth; and various other tools such as an alloy balance, an alcohol lamp, and a gold foil mallet.

What histories can objects such as these illustrate beside the usual chilling story of pain? We can start with the story of the development of the dental profession. Most of Dean's instruments belong to "Dr. G. V. Black's Cutting Instrument Set of 102." Dr. Greene Vardiman Black began practicing dentistry in 1856 after studying medicine under his brother for four years, working with a dentist for a few months, and reading a book on



The Trubyte Crown matching kit of the Dentists' Supply Co. of New York has suffered over the years, but the crowns are in wonderful condition. Crowns are still sold under the Trubyte trademark.

dentistry. He did not receive a formal dental degree until 1877, when the Missouri Dental College awarded him one on the basis of his work. His achievements included working with new materials for dental fillings, doing research on microscopic organisms in the mouth, publishing several important text books, and becoming Dean of the Northwestern University Dental School. His goal was to professionalize dentistry by establishing standard operative procedures using standardized tools. To that end, he developed a set of instruments with a specific numbering system for all dentists with professional training. To this day, dental students are expected to learn Black's numbering system and how to use the instruments he developed.

Hand in hand with the history of the profession of dentistry goes the history of the industry of dental



This set of hand tools from Dr. G. V. Black's Cutting Instruments Set of 102 was owned by H. Trendley Dean. The tools are numbered: "14-6-6" is a cutting edge fourteen-tenths of a millimeter wide, on a blade six millimeters long, set at an angle of six centigrades. A final number, from 1 to 102, identifies the instrument's place in the set.

tool manufacture. Black's instrument set was widely available in Dean's day. The dentist purchased these items from the Cleveland Dental Mfg. Co., the S. S. White Dental Mfg. Co, and the Ash Co. Many manufacturers of dental instruments from the early 1900s, unlike most pharmaceutical and medical supply companies, are still in business today.

Although present-day dentists would certainly recognize familiar instruments in Dean's set of Dr. Black's Cutting Instruments, new materials have now been incorporated into century-old designs. For example, Dean's impression trays have the same design as those used today, but the metal has since been replaced with brightly colored plastic. This reflects a change in understanding of infectious disease as well as newly available materials. Today's disposable impression trays are the result of concerns about blood-borne diseases such as AIDS.

Dean's dental instruments can also illuminate the level of knowledge and the nature of practice in dentistry, as well as the broader history of public health. Most of Dean's tools are for filling cavities,

removing diseased teeth and roots, and manufacturing replacements for missing teeth. These three tasks made up most of dental practice at that time. In Dean's early professional years, the causes of dental caries and other dental diseases were just beginning to be investigated. In contrast, a good deal of today's dental knowledge encompasses prevention of dental caries and gum disease and cosmetic techniques to improve the appearance of a patient's natural teeth.

Dean and his colleagues knew how to fill cavities and pull teeth. The Trubyte crown matching kit of the Dentists' Supply Co. of New York was used by dentists at a time when poor dental health affected almost every person in the United States. Most Americans in the first half of the 20th century would lose most, if not all, of their teeth by the time they were 45 years old. This public health problem came to national attention when thousands of men were deemed unfit for duty for World War II because of bad teeth. Indeed, the cost to society of such widespread chronic pain, including slowed economic production and insufficient military preparedness, were significant.

The instruments also help to tell the personal story of H. Trendley Dean's career. The collection shows that Dean was involved in private and clinical practice as well as laboratory experiments. That Dean carefully preserved his collection, including paper envelopes of crown posts, indicates that the tools of his trade were important possessions. Dean's career history, of course, is closely linked to the story of dental research at the NIH. He began as the only dental researcher at the NIH, working with other scientists such as Elias Elvove in the Division of Chemistry, who developed a test that Dean used to measure the amount of fluoride in water. Originally, Dean began looking at fluoride as a cause of a dental condition called Colorado Brown Stain, which G. V. Black had also investigated before his death in 1915. Dean's research showed that the mottling was indeed caused by a high level of fluoride in the water, but also that the mottled teeth were resistant to dental caries. He then turned his research to determining the optimal amount of fluoride in drinking water

so that the water itself would protect against cavities without staining the teeth. As a result of his work and a major study of schoolchildren in Grand Rapids, Michigan, that city became the first in the United States to add fluoride to its drinking water in 1945. Other cities and towns followed this initiative. With new recognition of the extent of the public's dental problems and Dean's fluoride work inspiring hope (and controversy, since some disputed, then and now, his findings), dental research became a national priority. NIH established an entire institute devoted to dental research in 1948, seventeen years after Dean began his career at the agency. Dean became the first director of the new institute and remained in this position until he retired in 1953.

I am pleased to announce that the Stetten Museum will be focusing on Dean and dental history in several new projects this winter. First up is a web exhibit, "70 Acres of Science," which will focus in part on the scientific research done at the NIH during the mid- to late 1930s, when the NIH moved to its present site in Bethesda, Maryland. The web exhibit will use photographs of Dean's objects to help tell the story of his research. Does the sight of a dental pick make you nervous? Be prepared to see some close-ups! The web site will also present information about the instruments, Dean himself, and the development of dental knowledge in the 20th century.

The second way the Museum hopes to present the Dean collection is in a small physical exhibit that will offer visitors the opportunity to see the old-fashioned dental instruments up close. This exhibit will narrow the story to explain Dean's achievements as an NIH scientist. After all, the NIH's contributions are not created by institutions or laboratories; they are created by the people who work in the institutions and laboratories. A physical exhibit also offers visitors the chance to learn more about the NIH's past, and serves to remind them that today's successes are built on the struggles of yesterday.

As part of an effort to use material objects to expand teachers' and students' knowledge about the NIH, we are working with the Office of Science Education to create an educational



H. Trendley Dean

component for the "70 Acres of Science" web exhibit. We will use the history of fluoridation as a tool to teach science and history. The module will consist of information materials, lesson plans, and ideas for student projects. We hope these projects will be displayed at the NIH. We plan to develop this component over the course of the next year.

One of the most important lessons objects can teach us is that history is multi-faceted. A box of items can go from someone's attic to a museum and begin a new life: Dean's picks and crowns and scalers can tell us many stories, if we just take time to listen.

NIH History Highlights is published twice each year. Past copies are available at: <http://history.nih.gov/about/index.html>.

To subscribe: send an email with "subscribe" as the subject to leavitts@mail.nih.gov

Sarah A. Leavitt, Ph.D., Editor

New Stetten Fellows

Maya Ponte

Maya Ponte joined the Office of NIH History as a Stetten Fellow this fall. She will be working with NINDS to study the development of scientific and technical knowledge related to Transmissible Spongiform Encephalopathies (TSEs) and the application of this knowledge to the management of TSEs through public policy. Ponte is an M.D./Ph.D. student in the final year of her dissertation studies on the history and anthropology of TSEs at the University of California-San Francisco. She has completed extensive research on the scientific development and policy management of TSEs in the U.K. and will now be focusing on the U.S.

TSEs comprise a devastating, biologically unique form of disease that affects both humans and animals of many different species. Examples of TSEs include Bovine Spongiform Encephalopathy (BSE), or “Mad Cow Disease,” Chronic Wasting Disease, which affects deer and elk in North America, and Creutzfeldt-Jakob Disease, the most common form of the disease in humans. The transmission of BSE to humans has resulted in the death of over 150

individuals, mainly young adults.

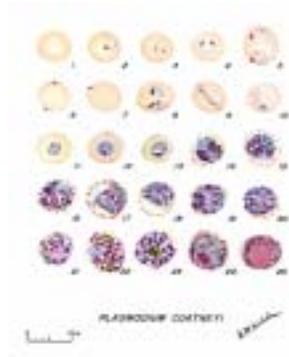


A TSE-affected brain slowly becomes sponge-like, filled with millions of tiny holes.

This process is

thought to be triggered by the aggregation of malformed prion proteins. While prion proteins are produced naturally by cells in the body of many organisms, they are capable of adopting a malignant conformation which contributes to the pathology and death of neurons. NINDS and NIAID intramural scientists and NINDS extramurally funded scientists have made significant contributions to the elucidation of this process and to the field of TSE research in general. During her time at the NIH, Ponte plans to conduct oral history interviews with many of these scientists as part of her research.

Leo Slater



These malaria parasites were named for G. Robert Coatney, Ph. D., formerly Chief, Laboratory of Parasite Chemotherapy, NIAID, NIH. The plate was painted by Gertrude Nicholson, NIH.

Leo Slater comes to NIH from the Max Planck Institute for the History of Science in Berlin. He holds a Ph.D. in History from Princeton University and an M.S. in Chemistry from Stanford University. The first Stetten Fellow to work with the National Institute of Allergy and Infectious Diseases (NIAID), Slater will study the history of malaria research. He will be working with Dr. Thomas E. Wellems and Louis H. Miller of NIAID’s Laboratory of Malaria and Vector Research. Slater plans to conduct oral history interviews with scientists as part of his research.

Slater's work with NIAID follows a research project he conducted on the history of the U.S. government program to find antimalarials during World War II, and he sees connections between the wartime program and those in the postwar period. For example, with the emergence of widespread drug-resistant malaria, especially chloroquine resistance, new research needs arose. Examples include the following: (1) investigations into the cellular/biochemical mechanisms of drug resistance; (2) investigations into the genetic basis for drug resistance (parasites’ genomes); and (3) renewed hope for, and emphasis on, the development of vaccines against malaria.

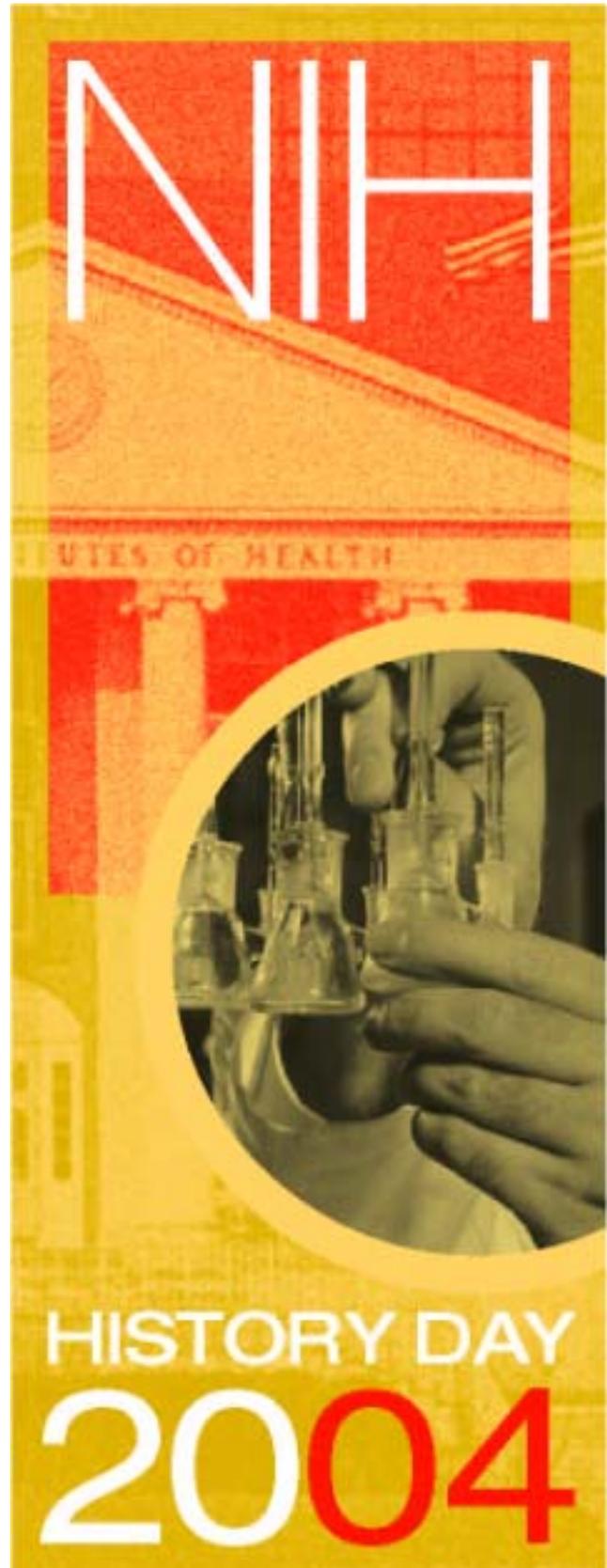
He plans to examine these and related programmatic areas at NIAID, as well as the individuals and teams—the human story of creativity and innovation—that made the research possible.

Second Annual NIH History Day

The Second Annual NIH History Day took place on the NIH campus on September 21. The main events this year included a seminar and lecture by Thomas Söderqvist, an historian of medicine at the University of Copenhagen in Denmark. The Office of NIH History sponsors the annual event to build awareness on campus of its activities and collecting practices. If you work at the NIH and have items of historical importance you would like to donate to our office, please call (301) 496-6610.

Söderqvist spoke about scientific biography in general and about his most recent subject, immunologist and Nobel Prize Winner Neils Jerne, in particular. Jerne, an immunologist who sat on NIH study sections in the 1960s, won the Nobel Prize in 1984 for his work on theories of antibody formation and the regulation of the immune system. Söderqvist posed some provocative questions in his lecture: Why should we remember a scientist like Jerne (several of his theories have been widely discredited) or any other life scientist? And generally speaking: What's the use of biographies of scientists? What can we learn from them? He outlined seven reasons why historians and others write biographies: to serve as a personal commemoration; to serve as a public commemoration; to be educational; to be a good read; to understand the creation of theories, concepts, and facts; to understand history at large; and finally, to understand life as an achievement. This last reason was the focus for Söderqvist's book, *Science as Autobiography: The Troubled Life of Niels Jerne* (Yale University Press, 2003).

Söderqvist wanted to investigate Jerne's life because Jerne had kept more than just his scientific papers. His personal archive also contained thousands of private letters, diaries, and scrap notes with passing thoughts, as well as all sorts of paraphernalia, like book-loan receipts, movie ticket stubs, chess records, domestic bills, medical prescriptions. These papers enabled Söderqvist to answer questions that cannot easily be addressed



by many biographers, such as: What choices (large and small) did Jerne make during his life? And what consequences did they have for him, for his work, and for others around him? Which kind of life situations attracted him and which did he try to suppress, or even flee from? What led him to pursue science instead of making a career in business, or a life as a physician, or a writer, or even a life of caring for family and children? In the end, it was Jerne's personal life— rather than his scientific work and its results — that took the central place in Söderqvist's narrative. As he pointed out in his presentation, a 21st-century scientific role model does not have to be uniformly good and positive. Today an edifying life story will probably refer to complex human characters who have life stories that have a lot of dark zones, narratives that present the reader with genuine moral dilemmas. To be a “model” is rather to have a life story that others can relate to — a life story that makes others begin to think about their own lives.

Söderqvist presented his thoughts to an audience of NIH scientists and staff, suggesting that biographies of scientists can also inspire scientists themselves to think about the way to handle their own lives both inside and outside science.

Top: Deputy Director of NIH Raynard Kington opened the NIH History Day program with remarks about the importance of preserving the rich history of the NIH.

Middle: Thomas Söderqvist presented his lecture alongside projected images of Neils Jerne.

Bottom: Participants mingled at the post-lecture reception outside the Lipsett Amphitheater.



Then and Now by Brooke Fox

On June 10 and 11, 2004, the final meeting of the Genetics Study Section (GSS) took place at the River Inn in Georgetown. This meeting, the end of the section's 46 years of service to the NIH, was marked by a brief opening ceremony honoring the section and its members. After having reviewed 11,816 applications, with 4,910 supported, during its run from FY 1958 through FY 2003, the GSS has earned its place in NIH history. The group has since been re-formed as the Genetic Variation & Evolution Study Section for Scientific Review.

Established in 1958, the section was assigned the task of reviewing grant applications in the then budding area of genetics research. The first meeting of the GSS took place on September 25, 1958, in the NIH Stone House (Building 16). Thirty one applications were evaluated, out of which 25 were funded, 3 deferred and 3 denied. Heading the study section at that time was Dr. Walter Burdette, who served as chairman from 1958 to 1961, and Katherine (Kay) Wilson, who served as Executive Secretary from 1958 until her retirement in 1977.

It was over this 46-year period that the field of genetics, and the GSS's role in it, boomed. By 1977, the GSS was receiving between 100-200 applications per round. To help prevent reviewer burnout, the study section was reorganized that same year into two sections by its new Scientific Review Administrator (SRA; previously known as Executive Secretary), Dr. David Remondini: (1) the Mammalian Genetics Study Section was designed to study medical and human genetics, pedigree analysis, and human population genetics; and (2) the Genetics Study Section to cover the basic and theoretical genetics research.

As archivist for the Office of NIH History, I participated in the GSS's final meeting and graduation dinner as the official videographer for the events. I recorded the opening ceremony at which members of the study section introduced themselves and explained their backgrounds in genetics research and how they came to be members of the GSS. During the dinner, I filmed Remondini offering his remarks and also the presentation of gifts to him by the study section members. These tapes are now part of our collection at the Office of NIH History.

Thank you to David Remondini, SRA, Genetic Variation and Evolution Study Section, Center for Scientific Research, for providing information for this article.



1959



2004

New Exhibit



A new exhibit called "Past in the Present," curated by Michele Lyons, has been installed outside the cafeteria on the third floor of Building 1. The exhibit is made up of six objects from the collection of the Stetten Museum ranging from unique laboratory glassware (above), to ticks, to the diary of an early NIH epidemiologist.

New Book



A new book *Mind, Brain, Body, and Behavior* (IOS Press, 2004) "seeks to fill the historical void" of information about the NIMH and NINDB in the 1950s. Editor-in-Chief and former Stetten Fellow Dr. Ingrid Farreras opens with accounts of both institutes' intramural programs and the book then offers essays by twelve prominent scientists

who worked in these programs in the 1950s.

The book is the result of a symposium organized by Farreras and the Office of NIH History in the spring of 2003 in which many former NIH scientists returned to campus to share their recollections.

News from the Office of Communications and Public Liaison

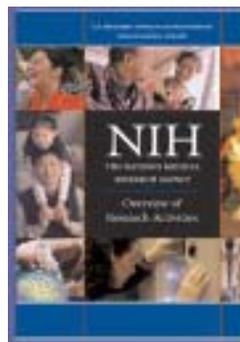


The NIH appeared on the NBC fall lineup (Fridays, 10 p.m.) this season with a new show: *Medical Investigation*. Taking place in a fictional version of the NIH, the show combines some of the roles of the CDC's epidemic fighters with NIH's clinical center patients and scientific researchers. OCPL has prepared a web site to inform viewers about

the diseases mentioned on the show. See: <http://www.nih.gov/health/medicalinvestigation/>

A new publication, *NIH Overview of Research Activities* describes the NIH's role in medical discovery and explains the NIH budget. The publication puts a human face on research by focusing on the scientists behind the discoveries and the people who benefit from NIH-supported research. The 80-page booklet also discusses: the importance of science and its impact on

human health; the greatest advances and challenges for the NIH; the NIH Director's vision; and the NIH Roadmap for Medical Research. It provides profiles of scientists, research advances, and key partnerships.



For a copy, please contact Carla Alvarez (alvarezc@od.nih.gov).